PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-135196

(43)Date of publication of application : 18.05.2001

(51)Int.Cl. H01H 25/00
H01H 15/18
H01H 25/04

(21)Application number : 11-312160

(22)Date of filing : 02.11.1999

(71)Applicant : HOSIDEN CORP

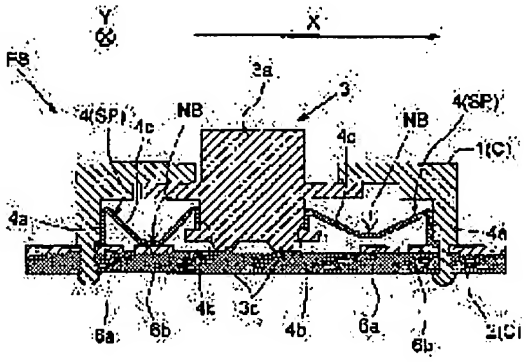
(72)Inventor : NIIYAMA TAKASHI

(54) SLIDING SWITCH

(57)Abstract:

PROBLEM TO BE SOLVED: To reduce the thickness of a sliding switch while simplifying the construction of a device.

SOLUTION: In the sliding switch in which energizing and shutting are switched between a pair of electrodes 6a, 6b by changing the attitude of an operated-portion energizing spring member SP with the sliding movement of an operated portion 3, a middle portion 4c exists between a pair of side supporting portions 4a, 4b, in mutually parallel attitude and in array in the sliding direction, of the spring member SP whose cross section shaped in a directional view perpendicular to the sliding direction of the operated portion 3 is changed in attitude in the range of existance of the side supporting portions 4a, 4b in viewing from the sliding direction with the sliding movement.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or

application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

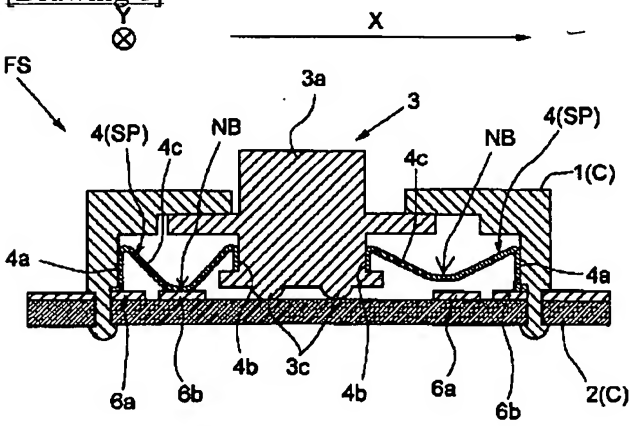
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The sectional view of the 4 direction slide switch concerning the gestalt of operation of this invention
[Drawing 2] The appearance perspective view of the 4 direction slide switch concerning the gestalt of operation of this invention
[Drawing 3] The assembly Fig. of the 4 direction slide switch concerning the gestalt of operation of this invention
[Drawing 4] The perspective view from the base side of the component part concerning the gestalt of operation of this invention
[Drawing 5] The representative circuit schematic of the 4 direction slide switch concerning the gestalt of operation of this invention
[Drawing 6] The sectional view of the 4 direction slide switch concerning another operation gestalt of this invention
[Drawing 7] The enlarged drawing of the flat spring concerning another operation gestalt of this invention
[Drawing 8] The explanatory view of the conventional technique
[Description of Notations]
GS Slideway
SP Spring member
2 Printed Circuit Board
3 Operating Member-ed
3d Slideway-ed
4 Flat Spring
4a, 4b Side supporter of a pair
4c Pars intermedia
5 Base Frame
6a, 6b Electrode of a pair

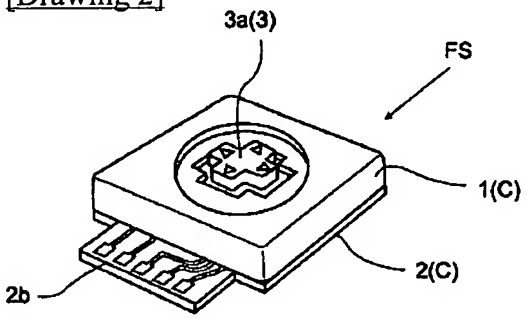
[Translation done.]

DRAWINGS

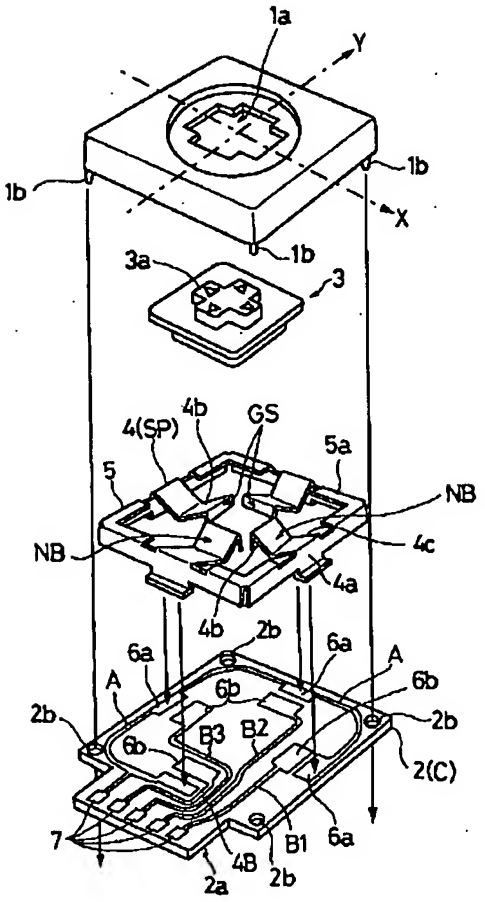
[Drawing 1]



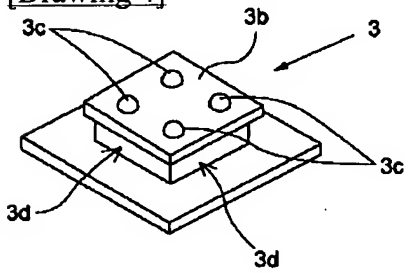
[Drawing 2]



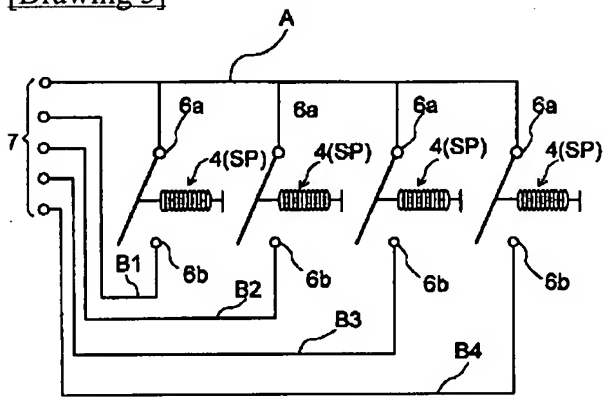
[Drawing 3]



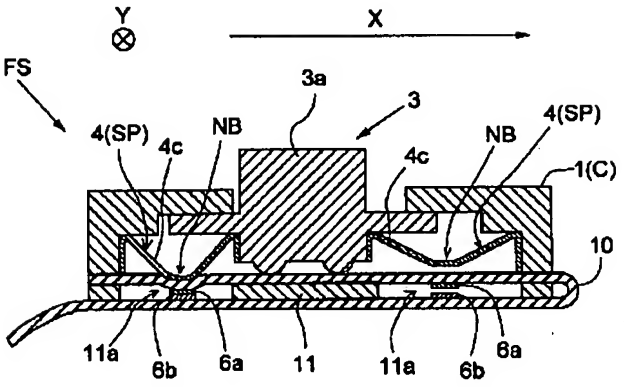
[Drawing 4]



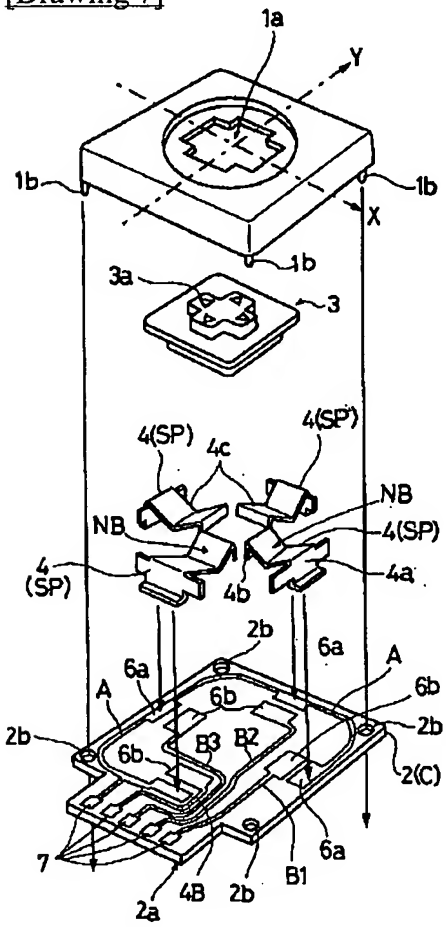
[Drawing 5]



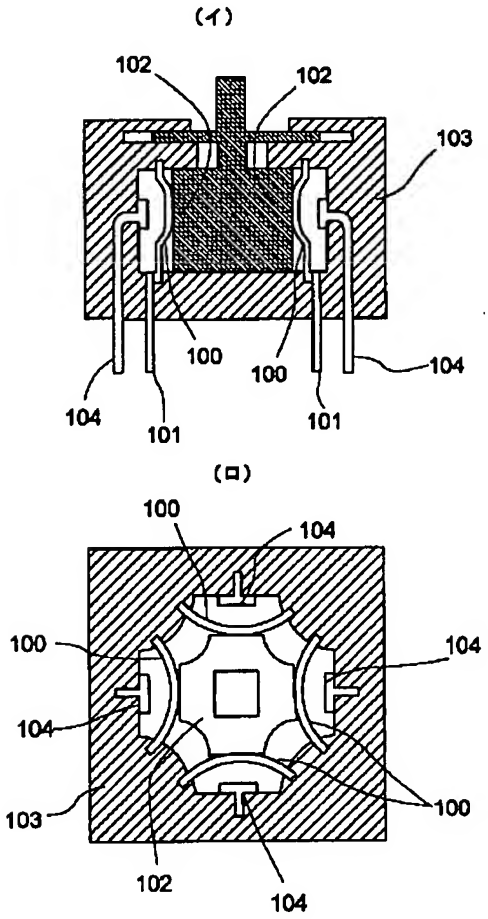
[Drawing 6]



[Drawing 7]



[Drawing 8]



[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] The operating member-ed held free [the slide migration to the cutoff actuated valve position for making the energization actuated valve position for making inter-electrode / of a pair / energize this invention, and inter-electrode energization of said pair intercept], The spring member which energizes said operating member-ed in the slide migration direction of that is prepared, and it is related with the slide actuation type switch constituted so that inter-electrode energization and cutoff of said pair may be switched and operated by posture change of said spring member accompanying slide migration of said operating member-ed.
[0002]
[Description of the Prior Art] If an operator resists the energization force of a spring member and this slide actuation type switch carries out slide actuation of the operating member-ed, a condition will change between the conditions that the condition of energizing to inter-electrode [of a pair], and its energization are intercepted, and the enter end of a switch will change. Thus, in order to constitute a switch at a slide actuation ceremony, the configuration as shown in the sectional view by the side view of drawing 8 (b) and the sectional view by the plane view of drawing 8 (b) is considered conventionally. The slide actuation type switch shown in drawing 8 is equipped with the metal flat spring 100 which curved to dished as a spring member with a vertical posture. The flat spring 100 is connected to one electrode 101 of the electrodes of a pair. It follows on the operating member 102-ed resisting the energization force of a flat spring 100, and slide actuation being carried out, and a flat spring 100 contacts the electrode 104 of another side with which the side attachment wall of the case 103 inside is equipped, it is turned on, and it will be in a condition (namely, condition that the operating member 102-ed is located in the above-mentioned energization actuated valve position). In addition, the time of the operating member 102-ed consisting of conventional examples shown in drawing 8 in the four directions at all as a 4 direction switch which carries out slide migration, and the location of the operating member 102-ed being in the neutral point of drawing 8 serves as the above-mentioned cutoff actuated valve position.
[0003]
[Problem(s) to be Solved by the Invention] However, conventionally [above-mentioned], with a configuration, since the electrode of said another side is located on the production of the migration locus of an operating member-ed while the vertical width of face of a slide actuation type switch will become size, since a flat spring is arranged with a vertical posture, the configuration for holding the electrode of said another side in the location is needed, and complication of a configuration is caused. For example, it is necessary to embed the electrode 104 of another side by insertion molding etc. in the case where it is shown in drawing 8 at a case 103. This invention is made in view of the above-mentioned actual condition, and the purpose is in the point of attaining thin shape-ization of a slide actuation switch, attaining simplification of an equipment configuration.
[0004]
[Means for Solving the Problem] If an operator resists the energization force of a spring member and does slide actuation of the operating member-ed by having the configuration of the claim 1 above-mentioned publication, a spring member will carry out posture change by elastic deformation, and a condition will be switched using posture change of this spring member between the conditions that the condition of energizing to inter-electrode [of a pair], and its energization are intercepted. The cross-section configuration of the spring member by the directional vision which intersects perpendicularly with the slide migration direction of an operating member-ed is formed in the configuration in which the pars intermedia where carries out posture change of the side supporter's existence range, and it moves by said slide migration directional vision with said slide migration between the side supporters of the pair which is an abbreviation parallel posture mutually and is located in a line in said slide migration

direction exists. That is, the energization force over an operating member-ed is produced by posture change of said pars intermedia, and the enter end of a switch can be performed using posture change of this pars intermedia.

[0005] Since said pars intermedia carries out posture change of the side supporter's existence range and goes by forming the cross-section configuration of a spring member as mentioned above, compared with a configuration said whose pars intermedia carries out posture change of the outside of the existence range by said slide migration directional vision, the tooth space for permitting posture change of said pars intermedia can be made small. Furthermore, it also becomes possible to arrange an electrode to the supporter of a spring member compared with the configuration which carries out posture change in the slide migration direction, and a spring member can simplify the support configuration of an electrode. While having and enabling simplification of an equipment configuration, thin shape-ization of a slide actuation switch is attained.

[0006] Moreover, it moves greatly [direction / a part for the flection of said slide migration direction center section / in / in connection with slide migration of an operating member-ed / said pars intermedia / carries out an abbreviation rectangular cross with said slide migration direction since crookedness formation of said slide migration direction center section / in / by having the configuration of the claim 2 above-mentioned publication / in said spring member / said pars intermedia / is carried out, and the cross-section configuration in said slide migration directional vision is formed so that the letter of the abbreviation for M characters may be made]. Since the enter end of a switch can be carried out using the big migration for said this flection, the enter end of a switch can be ensured.

[0007] Moreover, said spring member is formed with a conductive ingredient by having the configuration of the claim 3 above-mentioned publication. It is arranged so that one electrode of the electrodes of a pair with which said side supporter was formed on the printed circuit board may be contacted. Said pars intermedia is switched to the condition of estranging with the condition of contacting the electrode of another side of the electrodes of said pair formed on said printed circuit board, with slide migration of an operating member-ed. That is, as the spring member itself constitutes the energization path for the enter end of a switch, it enables it to form the electrode of a pair on one printed circuit board. Therefore, the arrangement configuration of the electrode of a pair can be simplified, as a result the configuration of a slide actuation type switch can be simplified further.

[0008] moreover, a thing equipped with the configuration of the claim 4 above-mentioned publication -- the electrode of said pair -- approach -- alienation -- it is supported by the direction possible [relative displacement]. It is switched to the condition of an operating member-ed following on slide migration actuation being carried out, and said pars intermedia carrying out a press operation to the electrode of said pair, and contacting the electrodes of said pair, and the condition of estranging from the electrode of said pair and making the electrodes of said pair estranging. Therefore, since it is not necessary to take into consideration about stabilizing the electric contact to a spring member and an electrode that what is necessary is just not to receive a limit of the ingredient which uses a spring member compared with the case where it constitutes as an energization path, and to take a mechanical press operation into consideration about contact to a spring member and an electrode, a design becomes easy.

[0009] Moreover, by having the configuration of the claim 5 above-mentioned publication, at least 4 sets of electrodes have gone into each independence, and are constituted by migration of a control unit-ed in four directions where said spring member consists of flat springs, and is prepared at least four, and a slide actuation switch meets an orthogonal axis as a 4 direction slide switch. It attaches for constituting such a 4 direction switch. Said flat spring An operating member-ed is energized from the methods of four so that each energization direction may meet at an orthogonal axis in the flat surface as for which an operating member-ed carries out slide migration. And it is arranged so that the energization direction of the flat spring arranged on both sides of an operating member-ed may turn into hard flow mutually, and on the other hand, it is parallel to either of said orthogonal axes, and the side supporter of said flat spring and the slideway-ed which **** are formed in the operating member-ed corresponding to each flat spring. Therefore, an operating member-ed is located at the neutral point when the energization force of these flat springs balances, when the slide operating physical force from the outside does not act

on it.
[0010] If a slide operating physical force acts from the exterior to an operating member-ed, while the slideway formed in the side supporter of each flat spring **** with the slideway-ed of a control unit-ed and permitting slide migration of the operating member-ed in the energization direction by each of each flat spring, and the direction which intersects perpendicularly, it regulates inclining from [the] slide migration. Therefore, even if slide migration actuation of the operating member-ed is carried out in the direction of arbitration from the above-mentioned neutral point, energization and cutoff of the electrode of a pair are switched about the direction where the slide migration of the four directions which carry out slide migration with the stable posture by which the inclination from said orthogonal axis was controlled, and meet said orthogonal axis by showing around at the slideway of each flat spring corresponds. It had, and it is a thin and simple configuration and, moreover, was able to come to offer the 4 direction slide switch which is stabilized and can perform slide actuation in the direction of arbitration. In addition, since the flat spring constitutes the spring member, said side supporter can be formed only by carrying out crookedness formation of the flat spring, for example, and the field by the side of the control unit-ed of the side supporter can be used as a slideway as it is.
[0011] Moreover, since the flat spring is really formed with the base frame arranged so that an operating member-ed may be surrounded by having the configuration of the claim 6 above-mentioned publication, the spring member which energizes an operating member-ed from four directions as mentioned above can be produced collectively, and the simplification of a configuration and simplification of assembly operation can be attained.
[0012]
[Embodiment of the Invention] Hereafter, the gestalt of operation at the time of applying the slide actuation type switch of this invention to the 4 direction slide switch is explained based on a drawing. As the 4 direction slide switch FS which shows an appearance to drawing 2 is shown in drawing 1 which is a sectional view, the operating member 3-ed and the spring member SP which energizes the operating member 3-ed in the slide migration direction of that are contained in the case C constituted by the up covering 1 and the printed circuit board 2 made of resin. The spring member SP is constituted by four flat springs 4 which energize the operating member 3-ed from the methods of four so that each energization direction may meet an orthogonal axis (drawing 3 is shown as an X-Y-axis).
[0013] Four flat springs 4 are really formed with the base frame 5 in the condition that an end side is fixed each of each side of the square base frame 5 by plane view, as shown in drawing 3 which is the assembly drawing of the 4 direction slide switch FS. The configuration which carries out press working of sheet metal of the metal plate, and is more specifically shown in drawing 3 is made. Therefore, each flat spring 4 consists of conductive ingredients, and constitutes a part of energization path of a switch like the after-mentioned. If each flat spring 4 is explained taking the case of what is shown in drawing 1 which is the sectional view of Y directional vision in drawing 3 The cross-section configuration of the flat spring 4 by direction (drawing 1 direction of Y) ** which intersects perpendicularly with the slide migration direction (drawing 1 the direction of X) of the operating member 3-ed It is formed at the configuration in which pars intermedia 4c which carries out posture change by elastic deformation exists among the side supporters 4a and 4b of the pair which is an abbreviation parallel posture mutually and is located in a line in said slide migration direction. More specifically Crookedness formation of said slide migration direction center section in the pars intermedia 4c is carried out, and it is formed so that it may have the cross-section configuration of the letter of the abbreviation for M characters. Therefore, each flat spring 4 is in the condition that between side supporter 4a of a pair and 4b was compressed, and energizes the operating member 3-ed in the elongation direction of that. For example, in the flat spring 4 on the right-hand side of drawing 1 , the operating member 3-ed is energized in the direction of "-X", and the flat spring 4 on the left-hand side of drawing 1 energizes the operating member 3-ed in the direction of "X", respectively. Moreover, the outside of the side supporters 4a and 4b of a pair, while side supporter 4a by the side of a way constitutes a part of above-mentioned base frame 5, it extends further caudad and the tip is formed in the shape of a hook.
[0014] Tongue 3a for actuation is formed in the top-face side of the operating member 3-ed, and opening

1a for making the tongue 3a for actuation project to the method of the outside of a case is formed in the up covering 1. the collar which catches and supports side supporter 4b of a flat spring 4 near the lower limit of the operating member 3-ed as the operating member 3-ed is shown in drawing 4 which is the perspective view seen from the lower part side -- 3b is formed and projected part 3c for reducing the touch area between printed circuit boards 2 is further formed in the lower limit of the operating member 3-ed four equivalent to each square top-most vertices.

[0015] Corresponding to four directions where the electrodes 6a and 6b of a pair met the above-mentioned X-Y-axis, 4 sets is prepared in the printed circuit board 2, and it will have been turned on with a switch with the condition that the condition of energizing between these electrode 6a and 6b, and energization are intercepted. Each [these] electrodes 6a and 6b are connected to each terminal electrode 7 of terminal area 2a currently formed in one side of a printed circuit board 2 by the predetermined circuit pattern as shown in drawing 3 . Electrode 6a located in the rim side of a printed circuit board 2 is connected to the terminal electrode 7 by circuit pattern A as a common electrode, and each electrode 6b by the side of the method of the inside of a printed circuit board 2 is connected to the terminal electrode 7 in a circuit pattern B1 - B4 at each independence, respectively.

[0016] It is arranged up and down and each above-mentioned component part is assembled, as shown in drawing 3 . as the procedure of an assembly -- for example -- first -- the operating member 3-ed -- a collar -- the operating member 3-ed is stuffed into the clearance between the centers of four flat springs 4, it is put on a printed circuit board 2, and the up covering 1 is put from a top so that the lower limit of side supporter 4b of a flat spring 4 may be caught in the top-face side of 3b. the hole for positioning which pin 1b for immobilization is projected and formed in the margo inferior of the up covering 1, and was formed in four corners of a printed circuit board 2 in this pin 1b for immobilization -- it inserts in 2b, and where the up covering 1 is pressed against a printed circuit board 2 side, said pin 1b for immobilization projected to the inferior-surface-of-tongue side of a printed circuit board 2 is heated, and a tip is rounded off and it fixes (refer to drawing 1).

[0017] Thus, in the condition of having been assembled, top-face 5a of a base frame 5 which holds four flat springs 4 to one **** to the inside of the up covering 1, and the part formed in the shape of [of the side supporter 4a lower limit of each flat spring 4] a hook is pressed by electrode 6a of a printed circuit board 2 with the spring operation. Moreover, since the energization direction of the flat spring 4 which between side supporter 4a of a pair and 4b energizes the operating member 3-ed from the methods of four where a cross section is compressed a little, respectively, and is arranged on both sides of the operating member 3-ed is hard flow mutually, each flat spring 4 of the letter of the abbreviation for M characters When the operating member 3-ed is located at the neutral point when the energization force of each flat spring 4 balances and the neutral point is located by the operating member 3-ed, tongue 3a for actuation of the operating member 3-ed is located in the center of abbreviation of opening 1a of the up covering 1.

[0018] while the operating member 3-ed is pinched by the up covering 1 and the printed circuit board 2 and has migration in the vertical direction regulated as mentioned above on the other hand, receiving the energization force by four flat springs 4 -- a X-Y flat surface -- the direction of arbitration -- a slide -- it is movable. the collar which the operating member 3-ed **** with four flat springs 4 -- as the upper part location of 3b is shown in drawing 4 , it is formed as a four[forward] -sided prism, and four side faces of the part of this four[forward] -sided prism are 3d of slideways-ed guided at side supporter 4b of each flat spring 4. 3d of these slideways-ed is parallel to either of the orthogonal axes X and Y respectively in the condition of ****(ing) to each flat spring 4, and they are ****(ing) 3d of four slideways-ed of the operating member 3-ed with the slideway GS by the side of the method of inside in side supporter 4b of four flat springs 4. Since a flat spring 4 cannot incline [of that] to right and left easily from energization due to plane view and Slideway GS is a flat surface, the slideway GS of each flat spring 4 has regulated permitting slide migration of the operating member 3-ed in the energization direction of each flat spring 4, and the direction which intersects perpendicularly, and inclining from [the] slide migration. Thereby, even if it makes the slide migration of the operating member 3-ed carry out in the direction of arbitration, posture change of the operating member 3-ed is fully controlled.

[0019] When an operator does slide migration of the operating member 3-ed in tongue 3a for actuation, like the flat spring 4 on the left-hand side of drawing 1 the flat spring 4 by the side of the migration direction of that Between side supporter 4a of a pair and 4b is compressed, the flection NB of the center of pars intermedia 4c of the flat spring 4 descends, and it **** to electrode 6b by the side of the method of the inside of a case of the electrodes of a pair, and it connects electrically and between electrode 6a of a pair and 6b will be in the condition which can be energized. The location of the operating member 3-ed at this time is an energization operation location for making it energize between electrode 6a of a pair, and 6b. On the other hand, if an operator lifts a hand from tongue 3for actuation a, the operating member 3-ed will return to the above-mentioned center valve position. With this slide migration, the flection NB of a flat spring 4 goes up, it estranges from electrode 6b, and between electrode 6a of a pair and 6b is intercepted electrically. This center valve position is a cutoff actuated valve position for making energization between electrode 6a of a pair, and 6b intercept. That is, as migration in four directions which meet an orthogonal axis (X, Y-axis) from the neutral point of the operating member 3-ed shows the electrodes 6a and 6b of the pair prepared 4 sets to the equal circuit of drawing 5 , energization and cutoff are switched to each independence. in addition -- above -- the operating member 3-ed -- the direction of arbitration -- a slide -- since it is movable, if slide migration actuation of the operating member 3-ed is carried out at the include angle which inclined 45 degrees from X and a Y-axis, for example, it will be in the condition which can energize 2 sets of electrodes 6a and 6b.
[0020] If the operating member 3-ed carries out slide migration between the above-mentioned cutoff actuated valve position and an energization actuated valve position, by slide migration directional vision, pars intermedia 4c will carry out posture change of the side supporters'a [4] and 4b existence range, and pars intermedia 4c of the flat spring 4 into which the side supporters 4a and 4b of a pair are compressed will move it, although Flection NB goes up and down as mentioned above. By this, flat spring's 4 in vertical direction existence width of face can be narrowed. In addition, pars intermedia 4c of a flat spring 4 does not need to fall within a side supporters'a [4] and 4b existence range completely in posture change of that, and a part may protrude it from said existence range. This may be formed so that it may set horizontally only not only in the vertical direction and the breadth of pars intermedia 4c may become large rather than the breadth of the side supporters 4a and 4b similarly.
[0021] [Another operation gestalt] Another operation gestalt is listed hereafter.
** Although the case where the electrodes 6a and 6b of a pair are formed as a circuit pattern on a printed circuit board 2 is illustrated with the gestalt of the above-mentioned implementation As various arrangement configurations of the electrodes 6a and 6b of a pair can be changed, for example, are shown in the sectional view of drawing 6 The so-called membrane sheet 10 in which the electrodes 6a and 6b of a pair were formed may be bent so that a spacer 11 may be wrapped, and you may constitute so that it may counter in through tube 11a which the electrodes 6a and 6b of a pair formed in the spacer 11. It can be displaced relatively in a direction. since the electrode of this pair is formed in the membrane sheet 10 -- approach -- alienation -- The condition of pars intermedia 4c carrying out a press operation to the electrodes 6a and 6b of a pair with slide migration of the operating member 3-ed, and contacting electrode 6a of a pair, and 6b, and (the left-hand side condition of a flat spring 4 in drawing 6), It is switched to the condition of estranging from the electrodes 6a and 6b of a pair, and making electrode 6a of a pair, and 6b estranging.
[0022] ** With the gestalt of the above-mentioned implementation, although four flat springs 4 are really formed with the base frame 5, as shown in drawing 7 , a flat spring 4 may be formed in another object.
** With the gestalt of the above-mentioned implementation, the energization force of four flat springs 4 is acting on the operating member 3-ed in the condition that the operating member 3-ed is located at a neutral point, and it is good also as a condition that each flat spring 4 develops most and has not produced the energization force in the condition that the operating member 3-ed is located at a neutral point.
[0023] ** Although the enter end of a switch is set up with the gestalt of the above-mentioned implementation so that it may be in the condition which can be energized between electrode 6a of a pair,

and 6b when energization between electrode 6a of a pair and 6b is intercepted when the operating member 3-ed is located at a neutral point, and slide migration actuation of the operating member 3-ed is carried out On the contrary, when slide migration actuation of the operating member 3-ed is carried out, you may constitute so that energization between electrode 6a of a pair and 6b may be intercepted. Thus, what is necessary is just to consider the electrode of the pair by which return energization is always carried out at the contact side as the configuration made to estrange in a press operation of the flection NB of the flat spring 4 accompanying slide migration of the operating member 3-ed, in order to constitute.

[0024] ** although the case where the slide actuation type switch of this invention is applied to the 4 direction slide switch is illustrated with the gestalt of the above-mentioned implementation, only come out not to mention being applicable to the switch which can switch energization and cutoff of the electrode of a pair by slide migration of control units 3-ed other than the 4 directions, such as one direction or a 2-way.

** Although the spring member SP is constituted from a flat spring 4, you may constitute from a gestalt of the above-mentioned implementation so that crookedness formation of the rod-like metal body may be carried out and it may become a configuration equivalent to the rim of the flat spring 4 in the gestalt of the above-mentioned implementation.

[0025] ** Although the cross-section configuration of a flat spring 4 carries out crookedness formation of the center of pars intermedia 4c and forms it in the shape of abbreviation for M characters with the gestalt of the above-mentioned implementation, it is good also as a configuration which the whole pars intermedia 4c curves with slide migration of the operating member 3-ed, and energizes the operating member 3-ed, without making pars intermedia 4c crooked.

** Although it has four flat springs 4 and the 4 direction slide switch is constituted from a gestalt of the above-mentioned implementation, division formation is carried out, the flat spring 4 in the gestalt of the above-mentioned implementation may be made to have in the direction of breadth, and the 4 direction slide switch may consist of five or more flat springs 4 as a whole.

[Translation done.]

CLAIMS

[Claim(s)]
[Claim 1] The operating member-ed held free [the slide migration to the cutoff actuated valve position for making the energization actuated valve position for making inter-electrode / of a pair / energize, and inter-electrode energization of said pair intercept], The spring member which energizes said operating member-ed in the slide migration direction of that is prepared. It is the slide actuation type switch constituted so that inter-electrode energization and cutoff of said pair may be switched and operated by posture change of said spring member accompanying slide migration of said operating member-ed. The cross-section configuration of said spring member by the directional vision which intersects perpendicularly with said slide migration direction with an abbreviation parallel posture mutually and between the side supporters of the pair located in a line in said slide migration direction The slide actuation type switch currently formed in the configuration in which the pars intermedia where carries out posture change of the said side supporter's existence range, and it moves by said slide migration directional vision with said slide migration exists.
[Claim 2] Said spring member is a slide actuation type switch according to claim 1 currently formed so that crookedness formation of said slide migration direction center section in said pars intermedia may be carried out and said cross-section configuration may make the letter of the abbreviation for M characters.
[Claim 3] Said spring member is formed with a conductive ingredient, and said side supporter is arranged so that one electrode of the electrodes of said pair formed on the printed circuit board may be contacted. The slide actuation type switch according to claim 1 or 2 constituted so that said pars intermedia may be switched to the condition of estranging with the condition of contacting the electrode of another side of the electrodes of said pair formed on said printed circuit board, with said slide migration.
[Claim 4] the electrode of said pair -- approach -- alienation -- the slide actuation type switch according to claim 1 or 2 constituted so that it may be switched to the condition it is supported by the direction possible [relative displacement], and said pars intermedia carries out a press operation to the electrode of said pair with said slide migration, and contact the electrodes of said pair, and the condition estrange from the electrode of said pair and make the electrodes of said pair estrange.
[Claim 5] [in the flat surface as for which said spring member is constituted from a flat spring, at least four are prepared, and said operating member-ed carries out / those flat springs / slide migration] Said operating member-ed is energized from the methods of four so that each energization direction may meet an orthogonal axis. And it is arranged so that the energization direction of the flat spring arranged on both sides of said operating member-ed may turn into hard flow mutually. It is parallel to either of said orthogonal axes to said operating member-ed, and the side supporter of said flat spring and the slideway-ed which **** are formed corresponding to each flat spring. Slide migration of said operating member-ed in the energization direction by each of each flat spring and the direction which intersects perpendicularly is permitted at said slideway-ed and the side supporter which ****. And the slideway which regulates inclining from [the] slide migration is formed. A slide actuation type switch given in any 1 term of claims 1-4 established at least 4 sets so that energization and cutoff may be switched to each independence by migration in four directions where the electrode of said pair meets said orthogonal axis from the neutral point of said operating member-ed.
[Claim 6] The slide actuation type switch according to claim 5 with which said flat spring prepared at least four is really formed, and is constituted with the base frame arranged so that said operating member-ed may be surrounded.

[Translation done.]